

Claims

1. (Currently Amended) A navigation apparatus for transmitting information of a guiding route to a navigation terminal for performing route guidance of a moving object, comprising:

a communication unit configured to perform communication with the navigation terminal;

a map data storing unit configured to store map data;

a route searching unit configured to search, using the map data, a guiding route between a departure place and a destination received from the navigation terminal through the communication unit;

a shape-simplified road map data generating unit configured to generate, using the map data, shape-simplified road map data which includes at least the guiding route and a road intersecting the guiding route, wherein the shape-simplified road map data generating unit linearizes each of links forming the guiding route as a first line section and corrects, for each of the links forming the guiding route, a position of an end of the link so that ~~[[a]]~~ the first line section ~~derived by linearizing the link~~ straightly advances to or orthogonally intersects a road connected to the end of the link;

a notice part detecting unit configured to detect as a notice part a part of the guiding route having a difference greater than a predetermined quantity in angle between a shape of the guiding route in the map data and the shape of the guiding route in the shape-simplified road map data;

a guidance notice information generating unit configured to generate, on the basis of the difference at the notice part between the map data and the shape-simplified road map

data, guidance notice information to be supplied to the navigation terminal when the moving object reaches the notice part in the route guidance; and

an information delivering unit configured to deliver delivery information including the shape-simplified road map data and the guidance notice information to the navigation terminal using the communication unit,

wherein the guidance notice information generating unit generates the guidance notice information for each of coordinate values in a plurality of the links following the part of the guiding route detected as the notice part and a following part, of the guiding route, out of the links forming the guiding route on the basis of increase and decrease trends in an angle made between a ~~first~~ second line section ~~[[of]]~~ between the ~~link~~ coordinate values in the road map data and ~~[[a]]~~ second ~~the first~~ line section of the guiding route in the shape-simplified road map data, corresponding to the first line section.

2. (Currently Amended) A navigation apparatus for performing route guidance of a moving object, comprising:

a map data storing unit configured to store map data;

a setting unit configured to receive, settings of a departure place and a destination;

a route searching unit configured to search, using the map data, a guiding route between the departure place and the destination;

a shape-simplified road map data generating unit configured to generate, using the map data, shape-simplified road map data which includes at least the guiding route and a road intersecting the guiding route, wherein the shape-simplified road map data generating unit linearizes each of links forming the guiding route as a first line section and corrects, for each of the links forming the guiding route, a position of an end of the link so that ~~[[a]]~~ the first

line section ~~derived by linearizing the link~~ straightly advances to or orthogonally intersects a road connected to the end of the link;

a notice part detecting unit configured to detect as a notice part a part of the guiding route having a difference greater than a predetermined quantity in angle between a shape of the guiding route in the map data and the shape of the guiding route in the shape-simplified road map data; and

a guidance notice information generating unit configured to generate, on the basis of the difference at the notice part between the map data and the shape-simplified road map data, guidance notice information to be supplied to the navigation terminal when the moving object reaches the notice part in the route guidance,

wherein the guidance notice information generating unit generates the guidance notice information for each of ~~a plurality of the links following the part of the guiding route detected as~~ coordinate values in the notice part and a following part, of the guiding route, ~~out of the links forming the guiding route~~ on the basis of increase and decrease trends in an angle made between a ~~first~~ second line section ~~of the link~~ between the coordinate values in the road map data and ~~a second~~ the first line section of the guiding route in the shape-simplified road map data, corresponding to the first line section.

3. (Previously Presented) The navigation apparatus as claimed in claim 1, wherein the shape-simplified road map data generating unit performs a process of thinning coordinate values from a coordinate value string representing a shape of the links forming the guiding route.

4. (Cancelled).

5. (Previously Presented) The navigation apparatus as claimed in claim 1, wherein the shape-simplified road map data generating unit performs a process of rotating a map forming object of the shape-simplified road map with respect to the departure place of the guiding route.

6. (Previously Presented) The navigation apparatus as claimed in claim 1, wherein the notice part detecting unit detects, with respect to the links forming the guiding route in the road map data, the link as the notice part when an angle made between a first line section which is a line section of the link, and a second line section of the guiding route in the shape-simplified road map data, corresponding to the first line section is equal to or greater than a predetermined value.

7. (Cancelled).

8. (Currently Amended) A route guiding method in which information of a guiding route is transmitted by a navigation apparatus to a navigation terminal for performing route guidance of a moving object, comprising:

a route searching step of searching, using map data stored in a map data storing unit, a guiding route between a departure place and a destination received from the navigation terminal;

a shape-simplified road map data generating step of generating, using the map data, shape-simplified road map data which includes at least the guiding route and a road intersecting the guiding route and in which a road shape of the guiding route is simplified,

linearizing each of links forming the guiding route as a first line section and correcting, for each of the links forming the guiding route, a position of an end of the link so that ~~[[a]] the first line section derived by linearizing the link~~ straightly advances to or orthogonally intersects a road connected to the end of the link;

a notice part detecting step of detecting as a notice part a part of the guiding route having a difference greater than a predetermined quantity between a shape of the guiding route in the map data and the shape of the guiding route in the shape-simplified road map data;

a guidance notice information generating step of generating, on the basis of the difference in the notice part between the map data and the shape-simplified road map data, guidance notice information to be supplied to the navigation terminal when the moving object reaches the notice part in the route guidance; and

an information delivering step of transmitting delivery information including the shape-simplified road map data and the guidance notice information to the navigation terminal,

wherein the guidance notice information is generated for each of coordinate values in a plurality of the links following the part of the guiding route detected as the notice part and a following part, of the guiding route, ~~out of the links forming the guiding route~~ on the basis of increase and decrease trends in an angle made between a ~~first~~ second line section ~~[[of]]~~ between the link coordinate values in the road map data and ~~[[a]] second~~ the first line section of the guiding route in the shape-simplified road map data, corresponding to the first line section.

9. (Currently Amended) A route guiding method in which a navigation apparatus performs route guidance of a moving object, comprising:

a setting step of receiving settings of a departure place and a destination;

a route searching step of searching, using the map data stored in a map data storing unit, a guiding route between the departure place and the destination;

a shape-simplified road map data generating step of generating, using the map data, shape-simplified road map data which includes at least the guiding route and a road intersecting the guiding route and in which a road shape of the guiding route is simplified, linearizing links forming the guiding route as a first line section and correcting, for each of the links forming the guiding route, a position of an end of the link so that ~~[[a]]~~ the first line section ~~derived by linearizing the link~~ straightly advances to or orthogonally intersects a road connected to the end of the link;

a notice part detecting step of detecting as a notice part a part of the guiding route having a difference greater than a predetermined quantity between a shape of the guiding route in the map data and the shape of the guiding route in the shape-simplified road map data; and

a guidance notice information generating step of generating, on the basis of the difference at the notice part between the map data and the shape-simplified road map data, guidance notice information to be outputted when the moving object reaches the notice part in the route guidance,

wherein the guidance notice information is generated for each of ~~a plurality of the links following the part of the guiding route detected as~~ coordinate values in the notice part ~~and a following part, of the guiding route, out of the links forming the guiding route on the~~ basis of increase and decrease trends in an angle made between a ~~first~~ second line section ~~of~~

~~the link~~ between the coordinate values in the road map data and ~~a second~~ the first line section of the guiding route in the shape-simplified road map data, corresponding to the first line section.